# Appropriateness of Minimum Nurse Staffing Ratios in Nursing Homes

# Overview of the Phase II Report: Background, Study Approach, Findings, and Conclusions[1]

## Background

### Purpose

The primary purpose of this study is to meet the requirements of Section 4801(b)(7)(e)(17)(B) of Public Law 101-508:

> Study on Staffing Requirements in Nursing Facilities.--The Secretary shall conduct a study and report to Congress no later than January 1, 1992, on the appropriateness of establishing minimum caregiver to resident ratios and minimum supervisor to caregiver ratios for skilled nursing facilities serving as providers of services under title XVIII [Medicare] of the Social Security Act and nursing facilities receiving payments under a State plan under title XIX [Medicaid] of the Social Security Act, and shall include in such study recommendations regarding appropriate minimum ratios.

The Federal Reports Elimination Act of 1998 extended the due date of this report to January 1, 1999. A Phase I report of preliminary findings was delivered to Congress in July, 2000. Although the Phase II report makes no recommendations, it should provide important information for any policy initiatives with respect to nursing home staffing. The following is a summary of Phase II.

### Public Concern With Nursing Home Staffing

Reports by the U.S. General Accounting Office, the U.S. Office of the Inspector General and the Centers for Medicare and Medicaid Services' (CMS), formerly the Health Care Financing Administration, comprehensive July 1998 nursing home Report to Congress have identified a range of serious problems including malnutrition, dehydration, pressure sores, abuse and neglect. Hearings before the U.S. Senate Special Committee on Aging and CMS' Phase I report have pointed to nurse staffing as a potential root cause of many of the problems observed. In addition, a continuous flow of newspaper articles and television news reports highlighting inadequate care and abuse in nursing homes has heightened public concern with this issue.

1 Author: Marvin Feuerberg, Centers for Medicare and Medicaid Services (CMS).

This concern across the country regarding adequate staffing in nursing homes has been reflected in several States among both those responsible for licensure standards and rate-setters. At least 29 States have imposed new, more stringent staffing requirements under their State licensure authority and several others have introduced State legislation in this area.

Reports by the Institute of Medicine (IOM) in 1996 and 2001 recommended a higher nursing home minimum (not a minimum ratio) of 24-hour registered nursing care. The IOM was not prepared to recommend a minimum ratio, in part because there was not sufficient knowledge to appropriately adjust any recommended ratio by the casemix of the patient population. Although the need for increased staff may seem intuitively obvious, the empirical evidence in support of this general position and *supportive of specific ratios* is fragmentary. Although the IOM reports along with CMS' Phase I report have provided some additional information, the essential question raised by the Omnibus Budget Reconciliation Act of 1990 (OBRA '90) -- whether an appropriate minimum ratio exists – has not received a definitive answer.

### CMS' Current Authority/Role in Nurse Staffing Requirements

Over 95 percent of U.S. nursing homes participate in the Medicare and/or Medicaid program(s). CMS is responsible for ensuring the health and safety of the residents of these nursing homes, who represent one of the nation's most vulnerable populations. Under the statutory authority of OBRA '87, CMS issued regulations and program guidance -- including a *general* requirement that nursing homes must provide ". . . sufficient nursing staff to attain or maintain the highest practicable . . . well-being of each resident . . ." Many professionals view this general requirement as too vague to serve as an adequate Federal standard. Federal regulations also specify *minimum* requirements of 8-hours of registered nurse and 24-hours of licensed nurse coverage per day. However, since this minimum is the same for all facilities (e.g., the same for a 60 bed facility or a 600 bed facility), many professionals also view this requirement as inadequate; they argue for a required minimum nurse staff to resident *ratio*. These professionals recommend minimum nurse staffing ratios that would be adjusted upward for nursing homes with residents who have greater care needs, such as those who suffer from Alzheimer's disease or other fragile medical conditions. The Congressional requirement for this study, described above, essentially asks the Secretary to determine if there is some appropriate ratio of nurses to residents.

### Public Policy and Nursing Home Nurse Staffing

Public policy impacts nurse staffing indirectly through payment rates established by Medicare and by individual State Medicaid nursing home payment systems (usually administered by a rate-setting component of the State Medicaid bureau). In addition, public policy decision-making impacts nurse staffing directly through quality regulations, including explicit nurse staffing standards administered by the State Health Departments and State survey agencies.

Despite considerable variation among States' Medicaid payment systems and between Medicare and Medicaid, all of the nation's public payments for nursing home services are fundamentally driven by historical spending patterns. Thus, if nursing homes have been historically understaffed, then public payment rates could require adjustment if policy makers require substantially different staffing patterns. If such adjustments were considered, both the level of payments and the advantages and disadvantages of a system that ties payment more closely to actual spending on staffing would merit examination. These structural features of payment were found to be important to both a system's incentives and its overall cost.

#### Evaluation Contractors, Study Investigators, And Technical Expert Panel

Abt Associates is the prime evaluation contractor for this study. Abt's Alan White, Ph.D., and Donna Hurd, RN, MSN served as Principal Investigator and Project Manager, respectively. Important subcontractors and/or consultants to Abt or CMS on this project include: University of Colorado Health Sciences Center, Andrew Kramer, MD, Principal Investigator; University of California, Los Angeles and Los Angeles Jewish Home, Anna & Harry Borun Center for Gerontological Research, John F. Schnelle, Ph.D., Principal Investigator; Survey Solutions, Inc., Beth A. Klitch, President; Barbara B. Manard, Ph.D., Principal, the Manard Company, Chevy Chase, Maryland; Susan C. Eaton, Ph.D., John F. Kennedy School of Government at Harvard University; and Mary Ann Wilner, Ph.D., Director of Health Policy, Paraprofessional Healthcare Institute. In addition, CMS' co-project officers for the study, Susan Joslin, Ph.D. and Marvin Feuerberg, Ph.D., have been responsible for much of the study design, implementation, and analyses employed throughout the project.

#### Technical Expert Panel (TEP)

Abt Associates convened a TEP to review and comment on key project deliverables, such as design plans for and results of technical analyses. The TEP was comprised of nationally recognized experts in long-term care, nursing, economics, and research and analysis.

#### Stakeholders Input

In addition to the formal TEP, Abt Associates and CMS sought and obtained input on the planned study design from different stakeholders in the long-term care staffing debate through other mechanisms, such as official meetings with representatives from consumer advocate groups, unions, and the nursing home industry. In addition, informal conversations were held with policy experts not included on the Abt TEP.

#### Attribution

A footnote on the first page of each of the 11 chapters details the appropriate attribution and acknowledgments for all of the analyses contained in the chapter. Although this is a CMS report for which it alone is responsible, *each of the reports received from contractors and subcontractors has not been changed or altered in any way*, other than minor editing.

# Study Approach

### Study Objectives

The primary objectives of the Phase I and Phase II studies are to determine: 1) if minimum nurse staffing ratios are appropriate and, if appropriate, 2) the potential cost and feasibility implications of minimum ratio requirements. Assessment of appropriateness was conceptualized to require, first, an analysis of the relationship between staffing ratios and quality. If no such relationship exists, then all other considerations related to appropriateness become moot. Conversely, if the staffing-quality relationship is real and substantial, then appropriateness of establishing minimum nurse staffing ratio requirements also entails the specification of the actual nurse staffing ratios, assessment of the costs, feasibility of implementation, and other considerations which are the subject of this Phase II report.

To address the first aspect of appropriateness – the link between staffing and quality - two core analyses were conducted. One analysis focused on nurse staffing levels necessary to avoid bad outcomes. The key study questions for this analysis were: *Is there some ratio of nurses to residents below which nursing home residents are at substantially increased risk of quality problems? Conversely, is there some ratio of nurses to residents above which no additional improvements in quality are observed?*

The other core analysis focused on nurse aide staffing thresholds minimally necessary to provide *care processes* consistent with the OBRA '87 *optimal* standards and related regulations and guidelines.

In both Phase I and Phase II reports, the phrase "nurse staffing" refers to all three categories of nurses: Registered Nurses (RNs), Licensed Practical Nurses (LPNs), and Nurse Aides/Nursing Assistants (NAs).

### Phase I Report Conclusions; Remaining Questions For Phase II

The analyses conducted in the Phase I Report firmly established that there are critical ratios of nurses to residents below which nursing home residents are at substantially increased risk of quality problems. These critical ratios (or thresholds) exist for certified nurse aides, total licensed staff, and registered nurses. This conclusion was based on new empirical analyses that were specifically designed to identify critical nurse staffing ratio thresholds, evidence that was not provided in other analyses, including both IOM reports. In addition, the Phase I analyses indicate that to meet the staffing thresholds, staffing levels would have to be increased in a substantial portion of facilities. However, due to a number of study limitations, the specific thresholds identified in Phase I were tentative. The Phase II study has replicated the prior analyses with more recent and better quality data, and a larger, more nationally representative sample of nursing homes.

The other core analysis of the Phase I study estimated the nurse aide time minimally necessary to implement five care processes which, in addition to routine care, have been linked to good resident outcomes. One limitation of this first study was that the minimum staffing levels required were projected only for an average nursing home. Many nursing homes are not average in the sense that facilities vary widely in terms of the residents they serve and the care requirements of these residents. The Phase II study has estimated the minimum necessary time for facilities that differ significantly with regard to the labor requirements necessary to implement the five care processes.

# Findings

## 1. Relationship Between Staffing and Quality: Results of Two Basic Research Strategies

Although the link between low staffing levels and quality problems may seem intuitively obvious, there is no necessary connection. Of course, if all the nursing staff were removed, residents would be in severe jeopardy. Clearly, at *some* ratio of nurse staffing substantially increased levels of quality problems would occur. But there is no apriori reason, apart from empirical evidence, to assume that any or a substantial portion of nursing homes actually staff at these critically low levels.

In addition to the Phase I review of prior research, we identified and used two basic research strategies for addressing the key study question of whether there are appropriate minimum nurse staffing ratios:

- **Empirical Determination of the Relationship Between Staffing and Quality**

Using data from a representative sample of 10 states including over 5,000 facilities, the objective of the empirical analysis was to identify staffing thresholds below which quality of care was compromised and above which there was no further benefit of additional staffing with respect to quality. Staffing data were obtained from Medicaid cost reports and analyses were conducted separately for Nurse Aides/Nursing Assistants (NAs), licensed staff (RNs and LPNs combined), and RNs within the licensed staff total, excluding management staff. Quality measures related to hospital transfer for potentially avoidable causes (e.g. urinary tract infections, sepsis, electrolyte imbalance) for a short-stay sample of Medicare SNF admissions, and selected quality of care issues for the treatment of long-stay nursing home residents who were in the facility for at least 90 days (i.e. functional improvement, incidence of pressure sores, incidence of skin trauma, resisting care improvement, and weight loss). To identify staffing thresholds, logistic regression was used to examine associations between incremental increases in staffing and whether facilities were in the worst 10 percent of facilities with respect to each quality measure, controlling for the unique resident characteristics that were predictive of each quality measure. The analysis was conducted at the facility level, separately for each quality measure and then aggregated across measures

using a weighted average based on prevalence of the quality problems in the short-stay and long-stay populations.

For each measure, there was a pattern of incremental benefits of increased staffing until a threshold was reached at which point there were no further significant benefits with respect to quality when additional staff were utilized. These thresholds for NAs occurred at 2.4 hours per resident day for the short-stay quality measures and 2.8 hours per resident day for the long-stay quality measures, and for licensed staff at 1.15 hours per resident day for the hospital transfer short-stay measures and 1.3 hours per resident day for the long-stay quality measures. Within these totals, RN thresholds were at .55 for the short-stay quality measures and .75 hours per resident day for the long-stay quality measures. Thus, these thresholds provide staffing levels below which facilities were more likely to have quality problems in the quality areas studied (facilities in the worst decile had 2 to 10 times the average rate of quality problems), and above which these rates were not improved by increasing staffing ratios. Some variation in staffing variables for different quality measures is not surprising given the variation in mix and staff resources required to prevent or treat different problems.

**Although no significant quality improvements are observed for staffing levels above these thresholds, quality is improved with incremental increases in staffing up to and including these thresholds.** Minimum staffing levels at any level up to these thresholds are associated with incremental quality improvements, with the greatest benefits as the thresholds are approached.

Implementation of these thresholds as minimum requirements would find 52 percent of all nursing homes failing to meet all of these standards and 97 percent failing to meet one or more. The analysis also indicated that implementation of thresholds lower than those above which maximize quality, would still result in substantial improvements in a smaller, yet substantial portion of all nursing homes.

While staffing levels up to these thresholds represent possible minimum staffing ratios in order to reduce the likelihood of quality of care problems, casemix may influence levels for specific nursing homes. The case mix analyses suggested that these staffing thresholds to prevent inclusion in the worst 10 percent of facilities were relatively similar, regardless of facility casemix. Fewer facilities in the lowest risk category were in the worst 10 percent of facilities with respect to quality, but it appeared that quality improvements occurred until about the same thresholds in each casemix category. However, with more facilities in the worst 10 percent of facilities in the higher risk case mix categories, it makes sense for staffing requirements to be higher (i.e. closer to the threshold) in higher risk facilities. To date no feasible approach to casemix stratification has been developed. If no feasible way to adjust the thresholds by casemix is ultimately identified, this would in no way invalidate the thresholds that were identified. This is because the multivariate models used to identify the thresholds adjusted for facility casemix and other facility characteristics that were predictive of the quality measures.

- **A Time-Motion Approach To Setting Nurse Staffing Standards**

Variations between facilities in the needs of residents should logically influence how many direct care staff are needed to provide five key care processes: 1) dressing/grooming independence enhancement, 2) exercise, 3) feeding assistance, 4) changing wet clothes and repositioning residents, 5) providing toileting assistance and repositioning residents. The probable staff workload variations to provide these processes were estimated in facilities in New York and Ohio by analyzing MDS data, which described variations between facilities in the needs of residents for feeding and/or dressing assistance and incontinence care. This exercise was considered applicable to all residents. The analysis resulted in the identification of three types of facilities, which could be categorized as high, medium, or low workload facilities. The effects of ten different staffing levels on the ability of these homes to implement all five care processes were next simulated in a 40-bed unit. Staffing levels were varied from eight to sixteen FTEs over the 24-hour period. The major outcomes reported are the percentage of scheduled care processes in addition to routine care that could be delivered and waiting times for incontinence care and feeding assistance.

It was concluded that from 14 FTEs (low workload facilities) to 16 FTEs (high workload facilities) are minimally necessary to provide all care on a timely basis. These FTE staffing levels are equivalent to 2.8 and 3.2 nurse aide hours per resident day, respectively. Staffing levels that are similar to those reported in many of the nation's nursing facilities (ratio of 8:1 on day shift, 10:1 on evening shift, 20:1 on night shift; an equivalent of 2.2 hours per resident day) are predicted to result in long waits for service and the inconsistent implementation of care even under conditions when staff are working at unrealistically high productivity levels. It is estimated that in 2000 over 91 percent of nursing homes have nurse aide staffing levels that fall below the staffing thresholds identified as minimally necessary to provide the needed care processes for their specific resident population. In addition, over 40 percent of *all* nursing homes would need to increase nurse aide staffing by 50 percent or more to reach the minimum threshold associated with their resident population, and over 10 percent would need to increase their nurse aide hours in excess of 100 percent.

- **Relationship Between Staffing and Quality: Comparing the Empirical and Time-Motion Approach**

Although the time-motion approach might possibly be applied to care processes delivered by licensed nursing staff, the analysis presented in this report was confined to nurse aides (NAs); hence, the comparison of the two research strategies is confined to NAs. Apart from these differences in the scope of the two approaches, they essentially differ in their focus on potential minimal vs. optimal standards and on actual outcomes vs. potential outcomes.

The ten-state analysis of over 5,000 facilities identified staffing NA thresholds below which quality of care was compromised and above which there was no further benefit of additional staffing with respect to quality. These (or lower) thresholds could be the basis for minimum

NA ratio requirements which would improve adverse rates of quality problems. However, quality problems would be found even if all nursing facilities met the threshold requirement. In contrast, the time-motion thresholds identify the minimal nurse aide staff *necessary* to provide *all* services (i.e., the stated OBRA '87 standard as staff sufficient to provide ". . .the highest practical, physical, mental and psychosocial well-being of each resident. . . ") that could benefit residents. Hence, this is an estimate of the minimally necessary nurse aide staff to provide optimal care.

The time-motion simulation standard should be viewed as a necessary condition for optimal care by NAs, not a sufficient condition. The simulation estimate *assumes* a very highly motivated and productive nurse aide staff. Even under conditions of nurse aide staffing that meet or exceed these thresholds of potentially available time, what nurse aides actually do and accomplish with respect to patient care is dependent upon a sufficiently skilled licensed staff to supervise aides as well as other organizational factors. It is important to note that the nurse aide threshold identified in the empirical analysis of actual nursing homes for the long-stay population, 2.8 hrs. /per resident day, is only slightly less than the median threshold of about 3.0 hrs. estimated from the simulation analysis. This does not mean that the difference between a minimal and optimal standard is only 0.2 hrs. The evidence from the empirical analysis indicates that a minimum requirement of 2.8 hrs/per resident day would yield the maximum quality attainable with the knowledge, skill, and management practices currently found in nursing homes. The slightly higher threshold of 3.0 nurse aide hrs/ per resident day identified in the simulation analysis will not yield *under current conditions* an optimal or even more quality. But if one *assumes* very high motivation, knowledge, and productivity – conditions currently not typically found in nursing homes – then an optimal standard will be achieved.

## 2. Appropriateness of Minimum Staff Ratios: Other Considerations

The "appropriateness" of establishing minimum nurse staffing ratios, the central policy issue of this Congressionally-mandated report, cannot be inferred solely from empirical studies demonstrating a strong relationship between critical staffing ratio thresholds and resident outcomes. Of course, if no such relationship is found or if the evidence is ambiguous, then the policy issue becomes moot. As noted above, the evidence supporting the existence of these critical thresholds is strong and compelling. But, as we have also noted, there are other issues relevant to a consideration of "appropriateness." Among these issues there is, first, the question of whether these staffing thresholds can or should be adjusted for casemix. Second, it can be argued that there is currently a sufficiently severe shortage of all nursing personnel that a mandated requirement could never be implemented, whatever the merits of higher staffing levels. Further, the workforce shortage may contribute to high turnover and lower retention of nursing staff which further compromises quality. Third, there is the question of whether the existing nurse staffing data are sufficiently accurate for determining compliance with any nurse staffing requirement that might be implemented. Fourth, there is the issue of the costs of increased staffing levels. Fifth, there are contentious and complex policies issues

that are related to how the current public payment system, Medicare and Medicaid, need to be modified to support improved staffing.

Apart from the impact of staffing on quality problems, these other issues are inherent in any consideration of establishing minimum ratio requirements. They are briefly discussed below.

**Appropriateness Issue: Does The Current Nursing Workforce Shortage Preclude Higher Minimum Staffing Requirements?**

An important consideration in evaluating the feasibility of a minimum nurse staffing requirement is whether the size of the nursing workforce is adequate to allow facilities to staff at the higher required levels. While available data limit the extent to which we can measure the size of the nursing shortage, there are good reasons for believing that a shortage currently exists, at least in certain parts of the country. Studies have found large increases in reported vacancy rates in recent years, and many nursing facilities report staff shortages. There are also good reasons for believing that the size of this shortage will increase over time.

Because of population changes, the demand for nursing care is expected to steadily increase. There is expected to be rapid growth of the elderly population—the number of individuals aged 85 and over, those most in need of nursing care, is expected to more than double over the next 30 years. Population trends suggest that the number of individuals entering the nursing profession will increase only slightly.

- Enrollment in schools of nursing has declined in recent years, and, as a result, the average age of the RN workforce has increased.

- The projected size of the female population between the ages of 25 and 54, the group which has traditionally filled most nurse aide positions, is expected to remain relatively unchanged between 2000 and 2030, limiting likely entry into nursing.

The staffing thresholds identified in chapter 2 would require large staffing increases at some nursing homes. Nationwide, the potential staffing thresholds identified in this report would require facilities to hire an additional 77,000 – 137,000 RNs, 22,000 – 27,000 LPNs, and 181,000 – 310,000 nurse aides. The requirement would increase overall demand (across all employment settings) for nurse aides by 13 – 21 percent and increase overall demand for RNs by between 5 and 9 percent.

The increased demand for nurses that would result from implementation of the staffing thresholds would likely require increases in the wage rates paid to nurses. These increases would affect not only nursing homes, but also other sectors (hospitals, home health) that compete with nursing homes for nursing staff. Our best estimate is that the thresholds identified in chapter 2 would increase RN wage rates by between 2.5 and 7 percent, an increase of between $0.50 and $1.40 per hour, given an average RN wage rate of $20.00 per

hour. For facilities to staff at the higher nurse aide levels that would be required, nurse aide compensation would need to increase by between 10 and 22 percent, an increase of between $0.86 and $1.89 per hour. The exact amount of the increase depends on the threshold adopted and the sensitivity of the nursing workforce to wage rate changes, but implementation of the minimum nurse staffing ratios identified in this report would have a considerable impact on nursing workforce requirements.

### *Minimum Nursing Expenditures: A Policy Alternative to Minimum Nurse Staffing Requirements*

Although the above estimates of wage increases necessary to meet the demand of higher staffing thresholds are substantial, they are not so high as to preclude the possibility of implementing the thresholds. Further, implementation of lower thresholds than optimal would still result in substantial improvements in a smaller, yet large percentage – even the majority - of all nursing homes. The wage increases necessary to meet the demand of these lower thresholds would also be lower.

It should be recognized that many nursing homes in some communities would find it difficult, perhaps impossible, to meet higher nurse staffing requirements, even with substantial increases in nursing wages. Under these circumstances, implementation of minimum requirements would create a demand for a procedure to waive the requirements. This was in fact what occurred when the current minimum requirements for licensed staff were first implemented under OBRA '87.

An alternative policy which might achieve the same objective of improving quality through enhanced resources for staffing would be a requirement for minimum expenditures for nurse staffing. This would permit each nursing home to allocate nursing resources to whatever configuration that in their judgment is most efficient given the labor market in their own community. In some communities, this policy might result in simply increasing staff numbers, others might direct wage increases to obtain more skilled Directors of Nursing, and still others might simply increase wages to existing staff. The effectiveness of this as a policy alternative - either as a replacement for or in combination with minimum nurse staffing requirements – depends on whether increased nursing expenditures in fact result in improved quality. An analysis conducted for this Phase II report indicates that this is indeed the case – i.e., there is strong evidence linking nursing expenditures to quality of care.

Total wages in dollars per resident day were associated with quality (i.e. not being in the worst decile) across the full range of wages for five of the quality measures described in the first section of findings above, suggesting that quality keeps improving in these areas as staffing expenditures increase. While not as strong as the relationships with staffing levels by type of staff, which held for more quality measures, this relationship with total wages suggests that minimum staffing expenditures may be another way to assure that facilities are adequately staffed. If this strategy is used, it would be wise to also include a minimum

requirement for licensed staff, which seems to be necessary to help prevent poor care in quality areas not associated with total wages (e.g. respiratory infections, weight loss). With no clear threshold for total wages, the tradeoff between cost of additional staff and impact on quality would need to be assessed to determine where to set a minimum.

**Appropriateness Issue: Does The Current Nursing Workforce Shortage Contribute To High Turnover And Retention Problems Which Adversely Affect Quality? If So, Can Turnover Be Reduced Within The Current Environment?**

As intuitively obvious as these presumed relationships may appear, the supporting evidence is rather slim. This is due, in part, to the absence of national data sources for turnover, and the questionable accuracy of the data for the smaller samples that are reported in the research literature. In many of the studies, the statistical models are weak. And it is possible that the relationships do not exist, or more likely, they are much weaker than presumed. Despite the general absence of direct evidence, there is a compelling rationale on the relationship between staff shortage and turnover/retention and the impact of both on resident quality of care. It is argued that high turnover compromises the continuity of care and supervision of staff. Further, several qualitative studies of nursing aides have pointed to the common perception of insufficient time to do needed care processes, not performing ("cutting corners") essential tasks, and the consequence stress and motivation of nursing aides to leave their jobs. [An analogous set of propositions could be formulated with respect to staff retention; the results of a statistical analysis are discussed below.]

What is not in doubt, however, is that the current level of turnover is quite high compared to other occupations, with several studies pointing to RN and CNA turnover rates above 50 percent and 100 percent, respectively. Statistical studies have pointed to the importance of wages, benefits, staffing levels, facility characteristics, and local labor market and economic conditions. An analysis was conducted for this Report which analyzed the impact of these factors on turnover with newly available 1999 turnover data for three states—California, Kansas, and Wisconsin. Relative to other sectors of the labor force, turnover rates in all three states were high, especially for nurse aides. Additionally, there was considerable variation in turnover levels across facilities. Evidence was mixed regarding the impact of wage rates on turnover. In California, however, nurse aide turnover was significantly lower at facilities with higher nurse aide wage rates. Benefit levels appeared to impact turnover much more than wage rates. Evidence was also mixed regarding the impact of staffing levels on turnover. Across all three states, turnover was significantly higher at for-profit facilities. Among the county level measures examined only the per capita income measure was related to turnover.

The findings and other considerations discussed in the Phase II Report suggest that a number of state programs and policies – e.g., Wage Pass Throughs (WPTs) and higher minimal staffing requirements – are unlikely to significantly reduce turnover. Moreover, overall statistical performance of the turnover models was modest. This suggests the potential

importance of factors that we were not able to measure, such as the management practices described above.

#### Nursing Staff Turnover Variation Within A Single Labor Market

Notwithstanding the above cautions, there is evidence supporting optimism about the potential effectiveness of a number of private initiatives to improve quality, staff recruitment and retention. The above three state analysis demonstrated considerable variability in turnover and retention among facilities within each state. Not only is there considerable variability within the examined states, but also within the same zip code, a very conservative specification of the local labor market. Thus it appears that the local labor market and other economic factors, while contributing to the generally high level of turnover, is not inconsistent with finding considerable variability within the same market.

A qualitative study was conducted for this Phase II report to complement the quantitative study described above. The research was conducted to answer the basic questions: Why does turnover among nursing staff vary so widely in long term care institutions, even among facilities in the same labor market? Also, what difference can management practices make in helping to understand the mechanisms for either high or low turnover? This research was conducted during spring and summer of 2001 in nine long-term care facilities in the three states noted above. The investigator gathered information directly from providers and staff about management practices and other factors that might affect nursing staff recruitment and retention. Facilities were selected in the top and bottom quartile of turnover, within the same labor market. The investigator conducted field studies at one or more "pairs" of facilities in each state. This study was designed to delve deeply into the reasons for turnover in a local labor market where NAs and other nursing staff had real choices of where to work, and why the workers themselves chose to stay at one facility and not at another. The fact that some nursing facilities exhibit very low turnover compared to nearby others when hiring and employing the same workforce makes some typical labor market explanations that identify a workforce problem of limited use.

The findings revealed that many specific managerial practices differed characteristically between low-turnover and high-turnover facilities. Overall, however, five areas stand out as distinguishing facilities with low nursing staff turnover. The five patterns found in this study to be associated with lower nursing turnover are:

- $ High quality leadership and management, offering recognition, meaning, and feedback as well as the opportunity to see one's work as valued and valuable; managers who built on the intrinsic motivation of workers in this field;

- $ An organizational culture, communicated by managers, families, supervisors, and nurses themselves, of valuing and respecting the nursing caregivers themselves as well as residents;

- $ Basic positive or 'high performance' Human Resource policies, including wages and benefits but also in the areas of 'soft' skills and flexibility, training and career ladders, scheduling, realistic job previews, etc.;

- $ Thoughtful and effective, motivational work organization and care practices; and

- $ Adequate staffing ratios and support for giving high quality care.

In sum, there appears to be a number of effective management practices resulting in reduced turnover that can and are implemented in many nursing homes, nursing homes operating within the current nursing shortage and without any additional resources that were identified.

**Appropriateness Issue: Are Existing Nurse Staffing Data Sufficiently Accurate For Determining Compliance With Any Nurse Staffing Requirement That Might Be Implemented?**

Enforcement of any federal or state proposed minimum staffing requirement for nursing facilities will necessitate an accurate nurse staffing measure that can be used to monitor compliance with the regulation. Even if minimum staffing requirements are not implemented, accurate staffing data are necessary to provide more information to consumers regarding nursing facility services. The Phase I report found that the current data sources for the reporting of nursing home staffing, OSCAR and State Medicaid Cost Reports, are often inaccurate. The goal of this task in the staffing study was to develop a mechanism to capture more accurate nurse staffing data.

During the Phase I report, payroll data were collected from nursing facilities in Ohio to assess the validity and reliability of staffing measures from OSCAR and Medicaid Cost Report data. The payroll data collection activity was designed to provide a "gold standard" measure for testing the accuracy of these staffing data. The goal in Phase II was to test the feasibility of collecting an expanded number of staffing variables from payroll records and contract agency staffing invoices. Staffing variables sought in this task included information on nurse staffing by licensure type (RN, LPN, NA), hours worked by unit, shift, day of the week, direct care vs. administrative hours and hours caring for Medicare vs. non-Medicare residents.

In Phase II, a nurse staffing data collection tool was developed and tested in 38 facilities in four states. Volunteer facilities were provided with the tool and asked to complete it. Nurse researcher consultants then visited the facilities to audit the completed tool against the source documents of payroll records and contract agency invoices. Through the examination of these records and interviews with facility staff, certain conclusions as to the feasibility of extracting staffing information from payroll records and contract invoices were drawn. There appears to be a great deal of variability in facility payroll records. Currently, the only staffing variable readily available from payroll records and contract agency invoices is total nurse staffing hours by licensure type (RN, LPN, NA). Extraction of this variable, although possible, is tedious as in most facilities the process requires the removal of hours paid but not

worked (e.g., sick leave, vacation) from total hours to determine hours worked. The verification process was far from what had been envisioned (i.e., simply comparing a number in the payroll record or invoice to a number reported by the facility on the tool). The research team's original thoughts that verification could be incorporated into the survey process appear unrealistic based on the current state of facility records. Electronic submission of a limited set of staffing variables would perhaps be a more feasible way to track and monitor facility staffing information.

#### Appropriateness Issue: Is The Cost Of Implementing Nurse Staffing Ratio Requirements So High As To Preclude Its Feasibility?

A *preliminary* analysis by CMS's Office of the Actuary indicated that the total national incremental cost of implementing the "preferred" minimum nurse staffing ratios identified in the Phase I analysis is on the order of $7.6 billion for CY 2001. Given that the Phase II thresholds are somewhat higher than the Phase I preferred minimums, we would expect these new thresholds to result in somewhat higher cost estimates. Ongoing work continues on the total resources to implement the staffing thresholds identified in this Phase II report. A definitive answer is not available at this time. However, the Actuary's estimate provides some sense of the order of magnitude required. A national incremental *nursing home* cost of 7.6 billion dollars represents an 8.4 percent increase over current expenditures – a substantial increase to be sure, but not so high as to preclude its feasibility. [It is also estimated that implementing the staffing thresholds would result in $1.9 billion in incremental cost to the non-nursing home health sector and a $0.5 billion cost saving due to reduced hospitalizations.] Further, implementation of lower thresholds would result in lower costs, but still result in improved nursing home quality.

As a partial effort toward understanding the potential cost implications of a minimum nurse staffing ratio for nursing homes, it is important to understand the amount of nursing care that is currently paid for by the Medicare programs. This is because the costs to the government associated with a staffing requirement can be thought of as the marginal costs of adequately paying facilities to staff at the minimum level relative to current payment levels.

Medicare expenditures under PPS related to nursing care were $2.56 billion in 1998, or $62 per resident day. This figure was somewhat less than what nursing expenditures would be if they were based on minutes from the staff time measurement data that was one source used by CMS to set Medicare nursing home payment rates. It is, however, close to what costs to facilities would be to staff at the minimum thresholds identified in chapter 2 of the Phase II report. In 1998 dollars, we estimate that it would cost facilities about $54 per day to staff at the thresholds identified by the short stay analyses and $63 per day to staff at the minimum levels identified by the long-stay analyses.

Some facilities would have to increase staffing levels substantially if a staffing minimum were implemented, but it appears that the PPS payment related to nursing care is nearly adequate for facilities to staff at the minimum required level, at least for Medicare residents.

However, as noted above, implementing the thresholds would result in some general wage inflation that would impact the non-nursing home sector.

**Appropriateness Issue: Apart From Total Costs, What Are The Policy Issues For Public Payers That Need To Be Considered?**

A policy analysis was conducted for this report which incorporates information from interviews with knowledgeable people representing a range of perspectives and experience, including Medicaid officials and providers in four states with state programs that offer potential models for elements of a national program.

The cost for public payers and the effect of new requirements and accompanying payments depends on programmatic design details. This is illustrated well by the different results of different approaches to estimating the potential cost of new minimum staffing requirements, discussed in chapter 10 of the Phase II report. In one approach, the cost of paying for adequate staffing is computed independently and then compared to what Medicare is currently paying for the nursing component of Medicare rates. That analysis suggests that a new minimum could be nearly cost free to Medicare, *if adequate payments for meeting minimums were the only issue*. Another analysis estimates the cost of bringing all nursing homes up to a new minimum staffing level, regardless of what homes are already getting in Medicare rates — that is, the cost of all the "missing staff" is first computed and then a share of that cost is allocated to Medicare. That approach suggests somewhat increased Medicare costs. A key difference between the two is that the second assumes that Medicare would supplement existing payments with an "add-on" sufficient to pay for "missing staff," regardless of the adequacy of current rates.
Differences between those two methods for estimating the cost of a new minimum staffing requirement are more than technical matters, to be best left to actuaries, economists and similar experts. Differences between the two methods are foremost a debate about accountability for Medicare and Medicaid monies. And in that issue lies the sharpest fissure dividing parties to the general debate. Thus, the choice between those two payment approaches is one of the most contentious that policy makers face at the state and federal levels.

Decisions about that and similar issues require policy-makers to strike an appropriate balance among competing objectives: spending sufficient money (both in rates and administrative costs) to achieve staffing objectives; reasonable cost containment; administrative feasibility; and equity. Equity is a particularly complex issue. It involves federal state relationships in general; equity among states with regard to any new federal funds (e.g., should states that have financed higher staffing levels for years get less of any new money than states that have lower staffing rates?); accountability and commitments to residents, taxpayers, and providers.

## 3. Importance Of Staffing-Relevant Factors Other Than Staffing Numbers/Ratios

A comprehensive assessment of the appropriateness of minimum staffing ratio requirements should also incorporate some assessment of the importance of staffing-relevant factors other than staffing numbers/ratios. Specifically, there is the question of whether nursing homes that fall below these thresholds could substantially mitigate quality problems with better management practices, including improved training. The study addressed this concern with three different analyses: qualitative case studies of management practices related to staffing; qualitative analysis of current nurse aide training practices; and a statistical analysis of the impact of a specific nonratio staffing factor, retention, on quality of care.

#### Qualitative Case Studies

Site visits were conducted at 17 nursing facilities in 3 states, involving observations and interviews conducted over all shifts and all days of the week, during about 10 days per facility. Nurse reviewers, who were experienced in long-term care and were trained in observation techniques, used both structured and unstructured methods to assess quality of care provided to individual residents in relation to the following staffing issues: staffing levels at the time of the observation, staff allocation among shifts and units, staff absences, use of agency staff, extended work hours, supervision, and nursing skills and training. These case studies revealed that the quality of resident care in nursing facilities was clearly influenced by staffing ratios; when inadequate numbers of staff were available to provide care and adequately monitor all residents, quality of care concerns were found. Even in situations where staffing levels appeared adequate, however, quality of care was compromised in many facilities, suggesting that to optimize care, staffing issues beyond minimum nurse staffing levels need to be addressed.

The relationship between quality and critical minimum staffing levels was supported by the case studies of individual facilities, units, and residents. These case studies permitted direct observation of care processes provided or not provided in contrast to the reliance on outcome measures, often self-reported, in the statistical analyses described above. When nurse staffing on particular units and shifts was particularly low by comparison to other nursing homes or the home's own routine level of staffing (i.e., they were "short-staffed"), the care provided was more likely to be inadequate. Sometimes this very low staffing did result in a serious incident, but the limited timeframe for the case studies would not permit observation of the cumulative impact of low staffing.

Below minimum staffing levels on particular units and shifts, there appears to be little facilities can do to mitigate quality problems. Above these minimum levels, addressing a number of nursing and management practices can optimize care. However, these minimum staffing levels of particular units and shifts, observed for a limited number of facilities, do

not permit a comparison with the facility-wide staffing levels analyzed in the statistical analyses described above.

One way in which facilities effectively expanded capabilities was through the involvement of non-nursing staff (e.g. activities staff, single-task workers, ancillary staff, housekeeping staff) particularly during the day shift, giving NAs more time to complete their tasks. Another way was making sure that adequate staff were available during peak hours such as meal times so that all residents could be adequately monitored/assisted, and/or having more than one meal sitting so that staffing was adequate for those requiring assistance. Adequate allocation of nursing staff to Alzheimer/dementia units was a frequent problem in many facilities, particularly when staff needed to be redistributed within a facility because of absenteeism.

Absenteeism often exacerbated chronic nursing shortages, a situation that occurred particularly for NAs on the night, evening, and weekend shifts. Functioning short staffed or requesting/mandating that nursing staff work additional hours and double shifts was a common short-term solution to staff absenteeism, but this practice appeared to eventually backfire. Staff motivation declined and nursing staff tended to get tired and call-in sick more frequently, continuing the short-staffing cycle. While many facilities were resistant to using agency staff in order to deal with short staffing because staff felt burdened by the need to orient agency staff and supervise them more closely, the case studies did not reveal a higher rate of quality of care concerns among agency staff relative to regular staff. Thus, with good supervision, use of agency staff may be the least problematic option to cover staff absences.

Good management and supervision including clear guidelines and procedures, clear expectations regarding standards of care, use of tools and materials to guide practice, and consistent enforcement of standards were essential to providing high quality care. Strong leadership among Directors of Nursing (DONs) as well as unit supervisors was critical, but frequently absent, in part because no training was provided for supervisory roles in nursing facilities. In addition, better training on assessment skills and how to manage cognitively impaired residents appear to require emphasis in nursing facility staff training.

#### Nursing Assistant (NA) Training

Apart from the case studies, a separate analysis was conducted on NA training with a focus on determining how their education helps prepare nursing assistants to deliver high-quality care, how it fails to help, and how it might be improved in order to serve that function more effectively. The methods employed in this examination included a review of the literature; consultation with nursing assistants, trainers, researchers, policymakers and other experts in the field of nursing assistant training; field observations of nursing assistant training programs; and interviews of nursing facility staff who hire newly certified nursing assistants or are responsible for ongoing education and training of nursing assistants.

This research identified a need to evaluate the current regulations governing the hours and content of nursing assistant training programs, which were found to vary extensively across all states. Specifically, training programs vary in number of hours devoted to classroom and clinical teaching, content taught, education methods employed, instructor qualifications, physical environment and educational resources. These characteristics were identified as contributing factors to the success and satisfaction or dissatisfaction nursing assistants experienced once they starting working in a nursing home, and to whether they remained working as a nursing assistant. Nursing assistants interviewed for this study indicated that classroom training provided only 50 percent of what they needed to know to do their job and the other 50 percent they learned informally on the job. Formal follow-up training is generally sparse, with most facilities offering only brief orientation sessions, little coaching or consistent oversight from supervisors, and repetitive monthly in-service training sessions that are not tailored to address specific areas of expressed interest or weakness among their staff or special needs exhibited by their residents. Furthermore, the cost of and access to training is a barrier to some potential workers, who need tuition assistance, classes in English as a second language, or other forms of assistance.

The analysis found that the job of a nursing home nursing assistant is relatively complex and requires comprehensive initial training supported by ongoing supervision and education. This includes more than the currently mandated 75 hours of class time and clinical work during precertification training, additional clinical training during a nursing assistant's first few months on the job to facilitate the transition from training to work, and formal supervision and continuing education throughout a nursing assistant's career. In addition to clinical skills, softer skills such as problem solving, communication and decision making must be taught, and teachers must be trained and experienced in adult education methods. For new hires, having a peer mentor or belonging to a peer support group appears to be effective in reinforcing learning, addressing specific areas that need improvement, boosting morale and improving retention. For seasoned employees, career ladders, attendance at professional conferences, and other professional advancement opportunities that recognize and reward additional learning and experience appear to improve morale and retention rates.

The conclusion from these two qualitative studies described in this section and the threshold analysis described above indicates that below *some* minimum staffing level there is little facilities can do to mitigate quality problems, although the case studies of staffing on particular units and shifts do not permit a comparison with specific facility-wide minimums identified in the statistical analysis. However, on the positive side, above these case study identified minimum thresholds care can be optimized by addressing a number of management practices, including improved training.

#### The Importance of Staff Retention

In general terms, staff turnover rate is defined as the numbers of staff who leave a nursing home during a time period (usually one year) divided by the average number of staff. In

contrast, the staff retention rate (sometime referred to as the stability or continuity rate) is defined as the number who have been employed for the entire time period (again, usually one year). All other things being equal, we would expect that an increase in the turnover rate would result in a decrease in the retention rate. But all other things are not equal, and the correlation between the two rates appears to be quite modest, but in the expected direction with high turnover associated with low retention. The California data, discussed above with reference to turnover, produced negative correlations between measures of turnover and retention of – .37 and – .35 for total direct nursing and nurse aides, respectively. These self-reported data are very likely subject to considerable (random) measurement error and the actual correlations are probably much higher.

Notwithstanding the likely measurement error in reported retention and turnover (and staffing levels, for that matter), the California data permitted for the first time an analysis of the impact of staff retention on the quality of care measures described above in the 10 state analysis. A strong relationship was found between nursing assistant retention and whether facilities were in the worst decile for five quality measures across almost the entire range of staff retention. Relationships between nursing assistant turnover and quality measures were weaker (only two quality measures showed a relationship) and there were thresholds above which turnover was no longer associated with quality. These findings persisted at different nursing assistant staffing levels. *The retention results in particular demonstrate the importance of other staffing factors besides staffing levels in quality of nursing home care.*

There is reason to believe that both high staff turnover and low retention can be improved with better management practices, as discussed above with reference to the case studies of low and high turnover facilities. To the degree that turnover and retention are highly correlated and the selection of case study pairs (high and low turnover facilities in the same local labor market) also selected on the basis of low and high retention, then the study's conclusion with respect to the importance of management practices on turnover would also apply with respect to improving retention and quality of care.

## Conclusions

This study has generated a wide array of evidence that bears on the question Congress asked us to assess, the appropriateness of establishing minimum nurse staffing ratio requirements:

- Strong evidence supports the relationship between increases in nurse staffing ratios and avoidance of critical quality of care problems. Above identified nurse staffing thresholds, however, increased staffing does not result in improved quality. Depending on the nursing home population, these thresholds range between 2.4 – 2.8, 1.15 – 1.30, and 0.55 - 0.75 hrs/resident day for nurse aides, licensed staff (RNs and LPNs combined), and Registered Nurses, respectively. Although no significant quality improvements are observed for staffing levels above these thresholds, quality

is improved with incremental increases in staffing up to and including these thresholds.

- Implementation of these maximum thresholds as requirements would find 97 percent of all nursing homes failing to meet one or more of these standards. The analysis also indicated that implementation of thresholds lower than those above which maximize quality, would still result in substantial improvements in a smaller, yet substantial portion of all nursing homes.

- An entirely different methodology estimated that in 2000 over 91 percent of nursing homes have nurse aide staffing levels below that identified as minimally necessary to provide *all* the needed *care processes* that could benefit their specific resident population. The nurse aide staffing ratios needed to implement these care processes varied from 2.8 to 3.2 hrs. /resident day, depending on the resident mix in the nursing home.

- The study assessed the importance of staffing-relevant factors other than staffing numbers/ratios. Specifically, the study addressed the question of whether nursing homes that fall below the above identified thresholds could substantially mitigate quality problems with better management practices, including improved training. The relationship between quality and critical minimum staffing levels was supported by the case studies of individual facilities, units, and residents. Below minimum staffing levels on particular units and shifts, there appears to be little facilities can do to mitigate quality problems. But these staffing minimums, to the degree that they can be translated into facility-wide averages, are well below the thresholds discussed above which result in the maximum quality observed.

  Above these minimum levels identified in the case studies, addressing a number of nursing and management practices can optimize care. These include the involvement of non-nursing staff; facility practices with respect to absenteeism; and good management and supervision including clear guidelines and procedures, clear expectations regarding standards of care, use of tools and materials to guide practice, and consistent enforcement of standards. A separate analysis found that the job of nursing assistant is relatively complex and requires more comprehensive initial training supported by ongoing supervision and education.

- A strong relationship was found between nursing assistant retention and whether facilities were in the worst decile for five quality measures across almost the entire range of staff retention. Although in a free society and market economy high turnover and staff retention could never be subject to regulation, the results of the retention analysis demonstrate the importance of other staffing factors besides staffing levels on quality of nursing home care.

- The increased demand for nurses that would result from implementation of the staffing thresholds would require increases in the wage rates paid to nurses. The thresholds identified in chapter 2 would increase RN wage rates by between 2.5 and 7 percent, an increase of between $0.50 and $1.40 per hour, given an average RN wage rate of $20.00 per hour. For facilities to staff at the higher nurse aide levels that would be required, nurse aide compensation would need to increase by between 10 and 22 percent, an increase of between $0.86 and $1.89 per hour. Although these estimates of wage increases necessary to meet the demand of higher staffing thresholds are substantial, they are not so high as to preclude the possibility of implementing the thresholds.

- An alternative policy which might achieve the same objective of improving quality through enhanced resources for staffing would be a requirement for minimum expenditures for nurse staffing. This would permit each nursing home to allocate nursing resources to whatever configuration that in their judgement is most efficient given the labor market in their own community. In some communities, this policy might result in increasing staff numbers, others might direct wage increases to obtain more skilled Directors of Nursing, and still others might simply increase wages to existing staff. The effectiveness of this as a policy alternative - either as a replacement for or in combination with minimum nurse staffing requirements – depends on whether increased nursing expenditures in fact result in improved quality. An analysis conducted for this Phase II report indicates that this is indeed the case – i.e., there is strong evidence linking total nursing wages in dollars per resident day to quality of care.

- The evidence produced for this report was inconclusive with respect to the impact of nurse staffing levels on turnover and retention problems. Even if it is established that the nursing shortage is an important determinate of turnover, this does not mean that the turnover problem cannot be addressed within the current environment. The results of a qualitative study conducted for this report indicate that there are a number of effective management practices resulting in reduced turnover that can and are implemented in many nursing homes — nursing homes operating within the current nursing shortage and without any additional resources that were identified.

- Enforcement of any federal or state proposed minimum staffing requirement for nursing facilities will necessitate an accurate nurse staffing measure that can be used to monitor compliance with the regulation. Even if minimum staffing requirements are not implemented, accurate staffing data are necessary to provide more information to consumers regarding nursing facility services. The current data sources for the reporting of nursing home staffing, OSCAR and State Medicaid Cost Reports, are often inaccurate. The research team, however, found that it was unrealistic to incorporate verification of staffing levels into the survey process based on the current

state of facility records. Electronic submission of a limited set of staffing variables would perhaps be a more feasible way to track and monitor facility staff information.

- An analysis conducted for this Phase II Report indicated that Medicare expenditures under PPS related to nursing care were $2.56 billion in 1998, or $62 per resident day. This expenditure is close to what costs to facilities would be to staff at the minimum thresholds identified in the Phase II report. Some facilities would have to increase staffing levels substantially if a staffing minimum were implemented, but it appears that the PPS payment related to nursing care is nearly adequate for facilities to staff at the minimum required level, at least for Medicare residents. In addition, a~~n~~ preliminary analysis by CMS's Office of the Actuary indicated that the total incremental nursing home cost of implementing the "preferred" minimum nurse staffing ratios identified in the Phase I analysis is on the order of $7.6 billion for CY 2001 – about an 8 percent increase over current expenditures.

- Apart from the total costs of minimum ratio requirements, there is the fundamental policy issue of how these costs are distributed among providers, public payers (Medicare and Medicaid), and private payers. In addition, there are questions about how policy-makers strike an appropriate balance among competing objectives: spending sufficient money (both in rates and administrative costs) to achieve staffing objectives; reasonable cost containment; administrative feasibility; accountability; and equity.

In addition, there is considerable discussion in provider trade publications (and some in scholarly journals, with additional research underway) suggesting various approaches that should be tried to improve staffing levels in a tight market and/or make more efficient use of current staff. However, relevant systematic program evaluations with national application are not available to help guide policy-makers choices. Thus, substantial uncertainty regarding the *optimal* approach to addressing staffing issues will not be resolved in the near term.

While stopping short of making specific policy recommendations, this Phase II report provides an empirical basis for any policy debate and initiatives related to nursing home staffing.